Dialogic

Release Notes

Dialogic® Brooktrout® Product Series

SDK Version 6.7.0

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For the latest product documentation, see http://www.dialogic.com/en/manuals/brooktrout/brooktrout.aspx.

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Table of Contents

Introduction to the Dialogic® Brooktrout® Product Series

The Dialogic® Brooktrout® Product Series is a set of sophisticated and feature rich products. These release notes capture the state of the product family at the time of its release(s). Generally, these release notes cover information that is either not in the user documentation or deemed to be of sufficient importance that it is highlighted in the release notes.

The Dialogic® Brooktrout® Product Series includes the following product lines:

- Dialogic® Brooktrout® TR1034-branded board-based T.38 IP, T1/E1, analog loopstart, DID, and BRI fax models
  (note – these products are often referred to herein as "TR1034" products)
- Dialogic® Brooktrout® TruFax®-branded analog and BRI fax models
  (note – these products are often referred to herein as "TruFax®" products)
- Dialogic® Brooktrout® SR140-branded IP Host-based Fax models
  (note – these products are often referred to herein as "SR140" products)

New Features in the Dialogic® Brooktrout® SDK 6.7

Windows Server 2012 R2

Added support for Windows Server 2012 R2.

RFC 6913 Support

Added support of IETF RFC 6913 for Indicating Fax over IP Capability in the Session Initiation Protocol (SIP). This feature allows service providers to selectively route FoIP calls over specific networks and improve the reliability of global FoIP faxing.

User Programmable T2 Timer

Added user programmable T2 Timer. This feature allows the configuration of the T2 fax protocol timer to better handle IP and PSTN network delays for T.38, G.711 and TDM faxes.

Improved G.711 Performance - SR140

Added modem and T.30 state machine enhancements to allow SR140 to have improved performance when using G.711 for faxing in deployments with network impairments. The jitter buffer for G.711 RTP is configurable to allow adjustments in impaired networks.

Changes in SDK 6.7.0 (From SDK 6.6.9)

The following section describes the customer-visible issues that have been resolved in this SDK release. The notation "*IPYnnnnn*" is used to reference a specific issue in Dialogic's change request tracking database.

- **Fixed IPY56815 -** On occasion, when using the automatic activation method with the SR140 License Manager application (brktlicmgr.exe), an error dialog would be presented to the user that the "Brooktrout License Manager has stopped working". This has been corrected.

- **Fixed IPY57317** - When starting under Windows, Boston Host Service would search for a hosts file in the \windows\system32\drivers\etc directory. With some installations of Windows, the hosts file is not present. In these cases an error is reported in the ECC log and all call control API functions fail. For example, BfvLineWaitForCall will report a "Not in a Connected State" error. This has been changed to ignore if the hosts file in the \windows\system32\drivers\etc directory is not present.

- **Fixed IPY57231** - Under Windows 2012 only, when the driver install program (install.exe) is used to first install and then remove the device driver, and then subsequently the Device Manager is used to install the device driver, the Device Manager will display the driver as not digitally signed. Also, some supporting files will appear to not have been created or installed. This has been fixed.

- **Fixed IPY57440 -**When using 64-bit applications which manipulates TIFF files, under some conditions files could be read or written improperly. This has been fixed.

- **Fixed IPY57360 -** Under certain conditions when the SR140 sends a G.711 INVITE meessage, if a gateway uses SIP Early Media and sends a SIP 183 PROGRESS with an SDP followed by a 200 OK also with an SDP, the SR140 may send a new G.711 INVITE and a BYE message immediately after. The SR140 would report a final call progress of SIT Reorder. This has been fixed.

Release Contents

The Dialogic® Brooktrout® Product Series SDK contains the following components:

Component	Version	Build
Boston Driver – Windows® (Microsoft-certified WHQL PnP driver)	6.7.0	6
Boston Driver – Linux and Solaris	6.7.0	7
Boston BFV API	6.7.0	7
Configuration Tool	6.7.0	7
TECUpdate Tool	6.7.0	7
Call Tracer	6.7.0	7
VTTY_Tracer	6.7.0	7
BSMI	6.7.0	7
Host Based Fax SR140 Virtual Module	6.7.0	7
TR1034 Series Control Processor	6.7.0	1
TR1034 Series low density DSP firmware	6.7.0	1
TR1034 Series high density DSP firmware	6.7.0	1
TR1034 Series high density DSP firmware (with V.34/T.38 fax)	6.7.0	1
TR1034 Series ultra-high density DSP firmware	6.7.0	1

Note: Windows® users should use the "File/Product version" and not the "File Version" in the "File Version Information" tab in the File Properties dialog box to view version information.

Firmware Files

The following table lists the firmware (embedded software) included with this release. The checksums were produced using the csum program that is provided in source and executable form in the *\Firmware\csum* directory.

Filename	Bytes	Checksum	Description
cp.bin	2944816	1887688F	**C**ontrol **P**rocessor firmware Use with all Brooktrout hardware platforms
dsp1000_ld.hex	770490	4F077247	**L**ow **D**ensity DSP firmware Supports V.34 and V.17 fax Use with LP01, LP02 LE01 HW platforms
dsp1000.hex	278774	301B2371	Medium Density DSP firmware Supports V.17 fax Use with HP02 HW platforms
dsp1000_v34.hex	636905	1C3E1A11	Medium Density DSP firmware Supports V.34, V.17 and T.38 fax Use with HP02 HW platforms
dsp1000_ud.hex	303467	3C753740	**U**ltra High **D**ensity DSP firmware Supports V.17 fax Use with HP03 and HE01 HW platforms
dsp1034_ud.hex	684379	470C423A	**U**ltra High **D**ensity DSP firmware Supports V.34, V.17 and T.38 fax Use with HP03, HE02, and HE01 HW platforms

Supported Operating Systems

A supported operating system is one for which this SDK has been designed and tested.

Windows®

This SDK is supported for the following versions of Windows®:

- Windows Server® 2012 R2, Standard Edition (64-bit)
- Windows Server® 2012, Standard Edition (64-bit)
- Windows® 7 Ultimate Edition 32-bit and 64-bit versions
- Windows Server® 2008 R2 (64-bit)
- Windows Server® 2008, 32-bit and 64-bit versions

Red Hat Linux

This SDK is supported for the following versions of Red Hat Linux. The base kernel (listed) is supported, together with any patches. The SDK also includes a Linux rebuild feature to support updated kernels.

- Red Hat Enterprise Linux 6.0 (2.6.32-71.el6), 32-bit and 64-bit versions
- Red Hat Enterprise Linux 5.0 (2.6.18-8.el5), 32-bit and 64-bit versions

Sun Solaris

This SDK is supported for the following versions of Sun Solaris:

- Solaris SPARC Version 11[*], 64-bit version, kernel SunOS 5.11 Branch: 0.175.1.0.0.24.2
- Solaris SPARC Version 10, 32-bit and 64-bit versions, kernel SunOS 5.10 Generic_118822-30

Note: Patch 124412-01 is required to support all PCI-Express slots on Sun Ultra 25

[*] Support only for Low Profile Brooktrout TR1034 Digital PCIe Fax Boards

Supported Hardware Platforms

The Brooktrout series of hardware platforms are supported by this SDK. Depending on the software downloaded to the platforms at runtime.

The following table describes the supported hardware platforms for this release:

HW Platform	Form Factor	Telephony Bus	IP Interface	Maximum Channels
LP02 TruFax® Analog LP02 TR1034 Analog/DID	Half length, universal PCI	N/A	N/A	2 ALS 4 DID
LP01-L TR1034 Analog	Full length, universal PCI	N/A	N/A	8
LP01-B TR1034 BRI LP01-B TruFax® BRI	Half length, universal PCI	N/A	N/A	4
HP02-H TR1034 T1/E1	Full length, universal PCI	H.100	1	30
HP03-H TR1034 T1/E1	Full length, universal PCI	H.100	1	96
LE02 TruFax® Analog LE02 TR1034 Analog/DID	Half length, PCI Express	N/A	N/A	2 ALS 4 DID
LE01-L TR1034 Analog	Full length, PCI Express	N/A	N/A	8
LE01-B TR1034 BRI LE01-B TruFax® BRI	Half length, PCI Express	N/A	N/A	4
HE01-H TR1034 T1/E1	Full length, PCI Express	H.100	1	30
HE02 TR1034 T1/E1	Low Profile, PCI express	N/A	N/A	30

Note: The model name and number of your hardware platform also appears on a label on the circuit board.

SR140 Product Family

There are two major SR140 products, the original full SR140 and the SR140-L. Each product differs in the available functionality, with the full SR140 having the highest functionality. The tables below summarize the feature set available for the different SR140 products over the course of their release history.

Note: Full SR140 and SR140-L licenses cannot co-exist in the same system.

Full SR140 Release History

Release	Date	Example Model Name	Feature Set
R1	Jul 2005	SR140-4F	• T.38 V17 • Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)
R2	Feb 2008	SR140-4F-V34	• T.38 V34 • T.38 V17 • Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)
R3	Nov 2009	SR140-4-R3	• G711 V34 fax pass-through • G711 V17 fax pass-through • IVR • T.38 V34 • T.38 V17 • Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)

SR140-L Release History

Release	Date	Example Model Name	Feature Set
R1	June 2010	SR140-L-4-R1	• Maximum 8 channels per system • T.38 V17 • Adv. Fax (Very High Res, MMR, JBIG/Color pass-through)

SR140-IAF Release History

Release	Date	Example Model Name	Feature Set
R1	March 2013	SR140-Feature-IAF150-4	• Maximum 60 supported channels per system • T.38 IAF speeds up to 150kbps • Optional Add-on to full SR140 license

Supported SR140 Virtual Modules

This SDK release supports SR140 host-based fax (HBF) modules, available in the following configurations:

SR140 Full

- SR140-DEV-R3, SR140-DEV-V34, SR140-DEV
- SR140-DEMO-1-R3, SR140-DEMO-V34, SR140-DEMO
- SR140-DEMO-2-R3, SR140-DEMO-2F-V34, SR140-DEMO-2F
- SR140-DEMO-24-R3
- SR140-DEMO-60-R3
- SR140-EVAL-2-R3
- SR140-EVAL-24-R3
- SR140-EVAL-60-R3
- SR140-2-R3, SR140-2F-V34, SR140-2F
- SR140-4-R3, SR140-4F-V34, SR140-4F
- SR140-8-R3, SR140-8F-V34, SR140-8F
- SR140-12-R3, SR140-12F-V34, SR140-12F
- SR140-22-R3
- SR140-24-R3, SR140-24F-V34, SR140-24F
- SR140-30-R3, SR140-30F-V34, SR140-30F
- SR140-48-R3, SR140-48F-V34, SR140-48F
- SR140-60-R3, SR140-60F-V34, SR140-60F
- SR140-FeaturePack-2-R3
- SR140-FeaturePack-4-R3
- SR140-FeaturePack-8-R3
- SR140-FeaturePack-12-R3
- SR140-FeaturePack-24-R3
- SR140-FeaturePack-30-R3
- SR140-FeaturePack-48-R3
- SR140-FeaturePack-60-R3
- SR140-DEV-FeaturePack-60-R3

These configurations can be combined on standard servers to support hundreds of ports.

The system limit depending upon many factors including the FoIP transport method, your application demands, operating system, physical or virtual machine, and host processor capacity.

Dialogic regularly tests the capacities of new processors, and current density test results are captured in the **SR140 (Host-based) applications - SR140 System requirements** section.

DEMO and EVAL license types cannot be combined with any other SR140 license including DEMO and EVAL licenses.

SR140-L

- SR140-L-DEMO-2-R1
- SR140-L-2-R1
- SR140-L-4-R1
- SR140-L-8-R1

- SR140-L-UPGRADE-SR140-2-R3
- SR140-L-UPGRADE-SR140-4-R3
- SR140-L-UPGRADE-SR140-8-R3

These configurations can be combined to support between 1 and 8 ports in a single server, depending upon your application. DEMO license types cannot be combined with any other SR140 license including DEMO and EVAL licenses.

SR140-IAF

- SR140-EVAL-IAF150-2-R3
- SR140-EVAL-IAF150-24-R3
- SR140-EVAL-IAF150-60-R3
- SR140-DEV-Feature-IAF150-60
- SR140-Feature-IAF150-2
- SR140-Feature-IAF150-4
- SR140-Feature-IAF150-8
- SR140-Feature-IAF150-12
- SR140-Feature-IAF150-24
- SR140-Feature-IAF150-30
- SR140-Feature-IAF150-48
- SR140-Feature-IAF150-60

These configurations can be combined to add IAF support to an SR140 Full license up to 60 IAF enabled channels in a server. The IAF feature license can only be used with full SR140 licenses and will not co-exist with SR140-L or SR140-LL licenses

The system limit depending upon many factors including the FoIP transport method, your application demands, operating system, physical or virtual machine, and host processor capacity.

DEMO license types cannot be combined with any other SR140 license including DEMO and EVAL licenses.

Multi use SR140-DEMO License Activation Keys (added in SDK 6.3.4)

The following License Activation Key can be used multiple times by different users to obtain a demonstration of the SR140. Different license keys are available for different products. There are two keys available, one produces a diagonal watermark and another produces a watermark in the right hand margin which may be more suitable for demonstrating OCR applications.

Title	License Activation Key	Description
SR140-DEMO-2-R3	650553011091	Full SR140 with diagonal watermark
SR140-DEMO-2-R3	755734006197	Full SR140 with right margin watermark
SR140-L-DEMO-2-R1	991762916424	SR140-L with diagonal watermark
SR140-L-DEMO-2-R1	720218074497	SR140-L with right margin watermark

Supported Fax over IP Equipment

For the latest listing of Dialogic® Brooktrout® FoIP interoperability information, refer to the following site:
http://www.dialogic.com/interoperability/fax.htm

This list includes the following hardware devices (and their respective software revisions) that have been tested for interoperability with the SR140 software:
- IP PBX
- Gateways
- Other devices

This SDK will interoperate with other T.38 routers and gateways due to standards compliance and similarities with other tested equipment. Routers from other vendors may interoperate with this SDK, but have not been specifically tested by Dialogic as part of this release.

Manufacturer & Router Family	Specific Device Tested	Supported Call Control Protocols
Aastra/Ericsson MX-One Telephony System	Aastra MX-ONE Telephony System (ANF 901 43) version 3.2 SP1 build 16	SIP
Alcatel OmniPCX	OmniPCX Enterprise (R7.1-f5.401-14-a-mx-c80s1) (R9.1-i1.605-21)	SIP, H.323 SIP
Alcatel OmniPCX	OmniPCX Office (OXO) R7.0.18.1	SIP
AudioCodes Mediant 1000 SIP	Mediant 1000 Software Version: 5.00A.035.003, DSP Software Version: 624AE3 => 209.16	SIP
Audiocodes MP-114	Audiocodes MP-114 firmware version 5.60A.025.005	SIP
Avaya G350 with S8300	Communication Manager 3.01 with update 628.6-11410 and G350 firmware 26.31.0	H.323
Avaya G350 with S8300	Communication Manager 5.0 with SES (SIP Enablement Services)	SIP
Avaya G650 with S8400	Communication Manager 5.0	H.323
Avaya IP Office	Avaya IP Office 500 with VCM 32 board (provides the DSPs for T.38) running IP Office Release 6.0(18) with a third-party SIP endpoint license, DevConnect certified on Release 7.0	SIP
BabyTel SIP Trunk	BabyTel SIP Trunk	SIP
Bell Canada SIP Trunk	Bell Canada SIP Trunk	SIP
BorderNet 504 PSTN-IP	BorderNet 504 PSTN-IP	SIP
Broadsoft	BroadWorks Release 18.SP1	SIP

Manufacturer & Router Family	Specific Device Tested	Supported Call Control Protocols
Broadview Networks	Broadspeed SIP trunking service	SIP
BroadVox SIP Trunk	BroadVox SIP Trunk	SIP
Cisco UC520	Cisco UC520-16U-4FXO-K9 VoIP Gateway running IOS v12.4(20)T2	SIP, H.323
Cisco 2600 Series	2621XM (IOS version 12.4(12)) 2651XM (IOS version 12.4(11)T))	SIP, H.323
Cisco 2800 Series	2801 (IOS version 12.4(13b)) 2821 (IOS version 12.4(16)) 2851 (IOS version 12.4(3b))	SIP, H.323
Cisco 2800 Series	IOS 15.1(1)T	SIP,H.323 V.34 T.38
Cisco 3700 Series	3745 (IOS version 12.3(11)T) 3745 (IOS version 12.3(14)T3) 3745 (IOS version 12.4(12))	SIP, H.323
Cisco 3800 Series	3845 (IOS version 12.4(11)T)	SIP, H.323
Cisco AS5400	AS5400 Universal (IOS version 12.3 (19))	SIP, H.323
Cisco CallManager	Cisco Unified CallManager Release 4.2.3 and greater in the 4.2.x line.	H.323, MGCP between the CCM and the Cisco media gateway
Cisco CallManager	Cisco Unified CallManager Release 5.0.4(a)	SIP
Cisco CallManager	Cisco Unified CallManager Release 6.0.1 and 6.1	SIP, H.323, MGCP between the CCM and the Cisco media gateway
Cisco CallManager	Cisco Unified CallManager Release 7.0 and 7.1.3	SIP, H.323, MGCP between the CCM and the Cisco media gateway
Cisco CallManager	Cisco Unified CallManager Release 8.0.2	SIP, H.323, MGCP between the CCM and the Cisco media gateway
Cisco CUBE	Cisco Unified Border Element w/ Cisco 2911 Cube Version 9.0, IOS Version 15.2-3.T1	SIP
3Com VCX V7000 platform	Software version 9.0.7 or later	SIP
3Com Media Gateway	Software version 4.40.211.387 or later	SIP
Dialogic® BorderNet 500 Session Border Controller	BN500 with inGate SIParator version 4.8.5	SIP

Manufacturer & Router Family	Specific Device Tested	Supported Call Control Protocols
Dialogic® BorderNet 504 PSTN-IP	BN504 with Ingate SIParator Version: 4.8.5 And Dialogic® Diva® System Release 9.5LIN SU1	SIP
Dialogic® BorderNet 3000 Session Border Controller	BorderNet 3000 using S/W version: C2.9.4.12	SIP
Dialogic® 1000 and 2000 Media Gateway Series	Gateway application version 5.1.118	SIP
Dialogic® 3000 and 4000 Media Gateway Series	Dialogic® DMG 3000 Media Gateway System Release 8.5.1WIN/LIN	SIP
Dialogic® IMG 1010 Integrated Media & Signaling Gateway	IMG 1010 (10.3.2 ER2 build 108)	SIP, H.323
Global Crossing SIP Trunk	Global Crossing SIP Trunk	SIP
Grandstream ATA	HT-502	SIP
Grandstream Media Gateway	GXW4024	SIP
Level 3	Level 3 SIP Trunk	SIP
Linksys SPA8000	Linksys SPA8000 (Software version 5.1.10)	SIP
Mitel 3300 MXe	Software version 9.0.3.15	SIP
MultiTech MVP210	Multitech MultiVoIP MVP210 with firmware version 6.11.27-07-Aug-09	SIP
Node4 SIP Trunk	Node4 SIP Trunk	SIP
Nortel CS1000	IP-PBX release 5.5	SIP
Patton Gateway	Patton 4554 BRI and the Patton 4960 PRI PRI - R5.4 2009-07-20 SIP BRI – R5.3 2009-05-20 SIP	SIP
Quintum Tenor	DX2024 Gateway (P104-12-10 with SIP Module 2.1.0) DX8192 Gateway (P104-12-10 with SIP Module 2.1.0)	SIP, H.323
Siemens HiPath 4000	HiPath 4000 V6	SIP
Siemens HiPath 8000	HiPath 8000 V3.0	SIP

Manufacturer & Router Family	Specific Device Tested	Supported Call Control Protocols
ShoreTel Gateway	ShoreGear 220T1A Switch (CI version of the software) Release 10 Build 15.6.4207.0 Release 11.1 Build 16.23.5609.0 Release 12.1 Build 17.22.5240.0 Release 13.3 Build 18.61.8701.0	SIP
Verizon SIP trunk	Verizon T.38 SIP trunk	SIP
XO SIP trunk	XO SIP trunk	SIP

System Configurations

The following sections list recommended system configurations for hardware-based applications developed for this SDK. This SDK may operate properly in systems containing more ports than shown here, but Dialogic has not tested systems other than the configurations listed in this section.

Hardware-based applications

The following tables list the maximum number of ports recommended for each hardware platform and minimum system requirements to support these densities. System requirements are representative of configurations tested by Dialogic.

Hardware System Density Requirements

Hardware Platform	Operations	Recommended System Density	
		Max ports	Max boards
LP01-L TR1034 Analog	V.34 Fax	32 ports	4 boards
LP01-B TR1034 BRI	V.34 fax	16 ports	4 boards
LP01-B TruFax® BRI	V.17 fax	16 ports	4 boards
LP02 TR1034 Analog/DID	Full-duplex voice play/record and V.34 fax on ALS, V.17 fax on DID	16 ports	4 boards
LP02 TruFax® Analog	V.17 fax	8 ports	4 boards
HP02-H TR1034 1 T1/E1	V.34 fax over T1/E1 or fax over IP	120 ports	4 boards
HP03-H TR1034 1 T1/E1 or 1 Ethernet	V.34 fax over T1/E1 or fax over IP	384 ports (V17) 240 ports (V34)	4 boards
LE01-L TR1034 Analog	PCIe V.34 Fax	32 ports	4 boards
LE01-B TR1034 BRI	PCIe V.34 fax	16 ports	4 boards
LE01-B TruFax® BRI	PCIe V.17 fax	16 ports	4 boards
LE02 TR1034 Analog/DID	PCIe Full-duplex voice play/record and V.34 fax on ALS, V.17 fax on DID	16 ports	4 boards
LE02 TruFax® Analog	PCIe V.17 fax	8 ports	4 boards
HE01-H TR1034 1 T1/E1 or 1 Ethernet	PCIe V.34 fax over T1/E1 or fax over IP	120 ports	4 boards
HE02 TR1034 1 T1/E1	PCIe low profile V.34 fax over T1/E1	120 ports	4 boards

Intel System Performance Requirements

Max Number of Ports	Processor	Memory	Max Number of Boards
192	Pentium 4 2.4 GHz	512 MB	2
384	One or Two Xeon 2.0 GHz	1 GB	4

SPARC System Performance Requirements

Max Number of Ports	Processor	Memory	Max Number of Boards
192	UltraSPARC IIIi 1.28 GHz	512 MB	2
384	One or Two UltraSPARC IIIi 1.28 GHz	1 GB	4

SR140 (Host-based) applications

SR140 System requirements

For guidance on system requirements, the following table shows the average measured CPU utilization that the SR140 software used when run with a number of V.34 or V.17 fax channels simultaneously when running a Dialogic test application on different server configurations. Results may vary when other applications are running simultaneously.

| Server Configuration | Physical Server % CPU utilization with simultaneous fax/voice channels (Based on WINDOWS 2003 Standard Edition 32-bit, using SIP Call Control) NOTE: Percentages are rounded-up to the nearest whole number | | | | | | | | | | | | | | | | | | | |
| | 48 channels total | | | | | 120 channels total | | | | | 240 channels total | | | | | 480 channels total | | | | |
	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34
1 core x P4 2.4 GHz 512 MB RAM	3%	5%	3%	6%	NT	8%	18%	14%	NT	NT	NT	NT	NT	NS	NS	NT	NT	NT	NS	NS
2 core x Xeon 3 GHz 1 GB RAM	2%	2%	2%	3%	3%	2%	5%	3%	7%	4%	6%	16%	11%	5%	NS	NT	NT	NT	NS	NS
6 core x Xeon 2.66 GHz 4 GB RAM	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	2%	1%	1%	2%	1%	3%	1%	5%	4%

Notes:
NT indicates this combination was not tested and may not be supported due to performance limitations
NS indicates this combination is not supported in this release of the SDK

	48 channels total					120 channels total					240 channels total					480 channels total				
Server Configuration	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34	T.38 V.17	T.38 V.34	IVR	G.711 RTP V17	G.711 RTP V34
2 core x Xeon 3 GHz 1 GB RAM Linux RH 5.0	3%	6%	7%	22%	31%	16%	25%	22%	33%	47%	32%	52%	48%	73%	NS	NT	NT	NT	NS	NS
6 core x Xeon 2.66 GHz 8 GB RAM Linux RH 5.5	1%	1%	1%	3%	4%	2%	4%	3%	9%	12%	4%	7%	6%	18%	23%	9%	14%	17%	43%	54%

Physical Server % CPU utilization with simultaneous fax/voice channels, using native vmstat performance monitor (Based on RedHat Linux 5.0 or 5.5, 32-bit, using SIP Call Control). NOTE: Percentages are rounded-up to the nearest whole number

Notes:
NT indicates this combination was not tested and may not be supported due to performance limitations
NS indicates this combination is not supported in this release of the SDK

SR140 and Virtual Machines

Virtual machines (VMs) work by time-sharing host physical hardware, and virtual machines cannot exactly duplicate the timing behavior of a physical machine. Differences and timing inaccuracies vary depending upon many factors including the hardware, type and version of VM, Operating System version, and the utilization of the hardware by applications on the same or other virtual machines.

The following performance tables show the average measured CPU utilization when running a number of SR140 channels simultaneously using a Dialogic test application, recording performance using the VM Host performance monitor. These tables summarize the performance test results, and are provided for guidance only since the results will vary greatly depending upon your application.

VMware

Please refer to the VMware Information Guide *Timekeeping in VMware Virtual Machines* for reference. It should also be noted that SR140 features which are more real-time in nature, for example G711 Fax or IVR, are more prone to the impact of these timing inaccuracies.

Supported Host and Client OS:

This SDK is supported for ESXi Server version 4.0.0 or later within the 4.0.x product line using the SR140 with any client OS supported by both the SR140 and the virtual OS.

VMware performance tables

VMWare 4.0 Server Configuration	CPU & RAM allocation per Virtual Machine	VMWare 4.0 ESX Server % CPU utilization with simultaneous fax/voice channels (Based on WINDOWS 2003 Standard Edition 32-bit, using SIP Call Control)								
		192 channels total (48 channels x 4 Virtual Machines)				240 channels total (120 channels x 2 Virtual Machines)	480 channels total (120 channels x 4 Virtual Machines)			
1 x 3GHz dual core Xeon CPU 8GB RAM	3GHz virtual CPU 512 MB RAM	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax	G.711V.17 Fax	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax
		15%	25%	30%	45%*	54%*	32%	55%	65%	NOT SUPPORTED

* Excessive PPRs, please refer to IPY56980 in the Known Issues and Limitations section

VMWare 4.0 Server Configuration	CPU & RAM allocation per Virtual Machine	VMWare 4.0 ESX Server % CPU utilization with simultaneous fax/voice channels (Based on RedHat Linux ES 5.0 32-bit, using SIP Call Control)								
		192 channels total (48 channels x 4 Virtual Machines)				240 channels total (120 channels x 2 Virtual Machines)	480 channels total (120 channels x 4 Virtual Machines)			
1 x 3GHz dual core Xeon CPU 8GB RAM	3GHz virtual CPU 512 MB RAM	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax	G.711V.17 Fax	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax
		15%	20%	20%	NOT SUPPORTED	NOT SUPPORTED	26%	40%	38%	NOT SUPPORTED

Windows Server® 2008 R2 Hyper-V™

Supported Host and Client OS:

This SDK is supported for Windows Server® 2008 R2 Hyper-V™ version 6.1.7600.16385 or later using the SR140 with any client OS supported by both the SR140 and the virtual OS.

Hyper-V performance tables

Hyper-V Server Configuration	CPU & RAM allocation per Virtual Machine	Hyper-V % CPU utilization with simultaneous fax/voice channels, using the "\Hyper-V Hypervisor Logical Processor(_Total)\% Total Run Time" performance monitor counter (Based on WINDOWS 2003 Standard Edition 32-bit, using SIP Call Control)								
		192 channels total (48 channels x 4 Virtual Machines)				240 channels total (120 channels x 2 Virtual Machines)	480 channels total (120 channels x 4 Virtual Machines)			
1 x 2.4GHz quad core Xeon CPU 4GB RAM	2.4GHz virtual CPU 512 MB RAM	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax	G.711 V.17 Fax	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax
		6%	8%	7%	16%	17%	11%	18%	15%	40%

Hyper-V Server Configuration	CPU & RAM allocation per Virtual Machine	Hyper-V % CPU utilization with simultaneous fax/voice channels, using the "\Hyper-V Hypervisor Logical Processor(_Total)\% Total Run Time" performance monitor counter (Based on RedHat Linux ES 5.0 32-bit, using SIP Call Control)								
		192 channels total (48 channels x 4 Virtual Machines)				240 channels total (120 channels x 2 Virtual Machines)	480 channels total (120 channels x 4 Virtual Machines)			
1 x 2.4GHz quad core Xeon CPU 4GB RAM	2.4GHz virtual CPU 512 MB RAM	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax	G.711 V.17 Fax	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax
		10%	12%	11%	NOT SUPPORTED	NOT SUPPORTED	16%	22%	18%	NOT SUPPORTED

Windows Citrix Xen 5.5.0 SR140 Performance Data

Supported Host and Client OS:

This SDK supports Citrix Xen 5.5 using the SR140 with any client OS supported by both the SR140 and the virtual OS.

Citrix Xen performance tables

Citrix Xen Server Configuration	CPU & RAM allocation per Virtual Machine	Citrix Xen v5.5.0 % CPU utilization with simultaneous fax/voice channels, using the Native "xenmon.py" performance monitor (Based on RedHat Linux ES 5.0 32-bit, using SIP Call Control)								
		192 channels total (48 channels x 4 Virtual Machines)				240 channels total (120 channels x 2 Virtual Machines)	480 channels total (120 channels x 4 Virtual Machines)			
		T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax	G.711	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax
1 x 2.26GHz quad core Xeon CPU 8GB RAM	2.26GHz virtual CPU 512 MB RAM	3%	4%	4%	NOT SUPPORTED	NOT SUPPORTED	7%	10%	8%	NOT SUPPORTED

Citrix Xen Server Configuration	CPU & RAM allocation per Virtual Machine	Citrix Xen 5.5.0 % CPU utilization with simultaneous fax/voice channels, using the Native "xenmon.py" performance monitor (Based on WINDOWS 2003 Standard Edition 32-bit, using SIP Call Control)								
		192 channels total (48 channels x 4 Virtual Machines)				240 channels total (120 channels x 2 Virtual Machines)	480 channels total (120 channels x 4 Virtual Machines)			
		T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax	G.711 V.17 Fax	T.38 V.17	T.38 V.34	IVR	G.711 V.17 Fax
1 x 2.26GHz quad core Xeon CPU 8GB RAM	2.26GHz virtual CPU 512 MB RAM	8%	10%	7%	14%	25%	12%	21%	14%	45%

Regulatory Compliance

Please refer to the Product Declarations and Global Approvals section on the Dialogic website for the latest information:

http://www.dialogic.com/declarations/default.htm

Software Installation

To install and configure the developer software for the Dialogic® Brooktrout® Product Series on Windows® platforms, please start with Chapter 1 – Quick Start in the *Dialogic® Brooktrout® Fax Products SDK Installation and Configuration Guide*. The Dialogic® Brooktrout® Product Series SDK includes all user documentation in the */Documents* directory.

For SR140 products, a license must be activated following the procedure listed in the *SR140 (Windows® or Linux) Users Guide*. TR1034 products do not require license activation.

Usage Notes

SIP URI Considerations

> SIP URI's must conform to RFC 2396-Uniform Resource Identifiers (URI) Generic Syntax. Any reserved character that is required to be passed to the remote device in a SIP URI must be escaped before forming the URI. An escaped octet is encoded as a character triplet, consisting of the percent character "%" followed by the two hexadecimal digits representing the octet code. For example, "%2C" is the escaped encoding for the US-ASCII comma character.

Interoperating in a network consisting of V.34 T.38 capable devices

> If the equipment you are communicating with includes V.34 T.38 capable devices; for example the Dialogic® 4000 Media Gateway Series, and any other non-V.34 T.38 equipment can correctly negotiate the T.38 fax version, you can change the default settings to support V.34 as follows:
>
> > t38_fax_version = 3
> > t38_max_bit_rate = 33600
> > rtp_ced_enable=false

Interoperating with Cisco V.34 T.38 capable devices

- For outbound V.34 T.38 calls (SR140 to Cisco) to succeed without falling back to V.17, the callctrl.cfg parameter media_renegotiate_delay_outbound must be changed to a value equal to or greater than zero. This change implies that the SR140 will initiate a T.38 changeover. The media_renegotiate_delay_outbound parameter is set to -1 by default. In the Configuration tool, this parameter can be found on the 'T.38 Parameters' tab of the 'IP Call Control Modules' section.
- Cisco IOS versions that support V.34 T.38 have added a new parameter, 'version', to the 'fax protocol t38' command. This parameter must be set to 3 in order to enable V.34 T.38 operation since the third version of the ITU-T's T.38 specification added V.34 support. This parameter can be set in the global configuration or an individual dial peer.
  Global configuration example:

```
!
voice service voip
   fax protocol t38 version 3 ls-redundancy 0 hs-redundancy 0 fallback none
   sip
!
Dial peer configuration example:
!
dial-peer voice 4443 voip
  destination-pattern 4443
  session protocol sipv2
  session target ipv4:10.10.10.1
  session transport udp
  voice-class codec 1
  fax protocol t38 version 3 ls-redundancy 0 hs-redundancy 0 fallback none
!
```

Interoperating with ShoreTel gateways

- Enabling redundancy for T.38 causes data errors when using the ShoreTel Gateway Software Release 10 Build 15.6.4207.0. For interoperability, the SR140 requires redundancy for both image and control to be set to 0.

- The ShoreTel Gateway sends a SIP session refresh if it is enabled on the ShoreTel Gateway, even if the SR140 is configured not to use SIP session refresh. This will cause the SR140 to drop the call if a SIP refresh is received. For interoperability, the SR140 must enable SIP session refresh or the ShoreTel Gateway must disable SIP session refresh by using the ShoreWare Director (select Call Control, then Options, then disable the session timer, and set the session interval and the refresher).
- The ShoreTel Gateway does not support V.17 for T.38. The maximum protocol supported is V.29 (9600 bits/sec).

Interoperating with Avaya gateways, Alcatel gateways and the Broadspeed SIP trunking service

Due to lack of T.38 Error Correction Mode (ECM) support on these systems, faxes containing errors caused by possible telephone line conditions are more likely to fail and therefore affect the overall fax completion rate under these specific conditions.

Tracing G711 RTP using wireshark

Wireshark decodes all G711 packets as T.38 after a SIP re-REINVITE or H245 requestMode for T.38 is rejected. https://bugs.wireshark.org/bugzilla/show_bug.cgi?id=2368

Applications using DID phone lines

When writing an application that collects DID digits, try to minimize the delay between the collection of the digits and when the application answers the call. If the call is not answered within 200 ms after the last DID digit, the CO (or PBX) may timeout and disconnect the call.

Systems with Intel 5500 Series or 5600 processors

Dialogic recommends disabling C-state support in the BIOS and/or OS of systems with Intel 5500 or 5600 processors; this may be referred to as CPU Power Saving Mode. This recommendation is due to Intel Errata AAK120 *Rapid Core C3/C6 Transition May Cause Unpredictable System Behavior* which affects all steps (C-0, C-1, D-0) of the 5500 Series processor and BD59 *Package C3/C6 Transitions When Memory 2x Refresh is Enabled May Result in a System Hang* affecting all steps (B-1) of the 5600 Series processors. In particular we experienced erratic timing behavior on Intel 5500 based systems during testing of Red Hat 6.0, which added support for the C6 Intel C-State.

Fax Pass-through (G711 RTP) Design Consideration

G711 RTP, particularly V.34 G711 RTP is more sensitive to network impairments than T.38. V.34 G711 RTP is not supported on a Virtual Machine. Please refer to Appendix A for a section on design considerations to help provide guidance to those deploying G711 RTP.

Known Issues and Limitations

This section lists the known issues/limitations on the product. These are classified in functional categories. The notation "*brkt~nnnn*" or "*IPYnnnnn*"is used to reference a specific issue in Dialogic's change request tracking database.

Installation, packaging and configuration

- IPY90652, IPY55491 – The Brooktrout system software may have dependencies on multiple versions of Windows system dll's (such as msvcrt80.dll) due to the use of pre-built libraries. Developer created install packages are expected to use the Microsoft side by side assembly feature of Windows to handle this. Installing the Brooktrout SDK or msi files will install the needed redistributable files automatically. Details on how to determine which re-distributable files are installed by the msi file can be found in the SDK Developer Guide. Developers may also use the Brooktrout merge modules to add the needed redistributable files to their own installers. Alternately, the needed Microsoft redistributable can be installed manually using this link:
  http://www.microsoft.com/downloads/details.aspx?familyid=766a6af7-ec73-40ff-b072-9112bab119c2&displaylang=en
- IPY54089 - If an application built using the Bfv API library uses ACE, that ACE library's symbols may conflict with those of the ACE library embedded in the Bfv API. This can cause runtime problems.
- IPY54300 - Sun Ultra 25 Server has unreliable PCI-Express Slots, labeled PCIE0, PCIE1. The failure mode was that the Dialogic cards fail to be recognized in the server for Solaris SPARC 9 and 10. Sun have resolved this issue. Patch 124412-01 is available on Sunsolve (OBP 4.25.7). Link to patch:
  http://sunsolve.sun.com/search/document.do?assetkey=1-21-124412-01-1
- IPY56463 – SR140 IPv6 with CUCM or Cisco router. If using IPv6 and CUCM or a Cisco Router be aware that Cisco does not support link-local IPv6 addresses.
- IPY56106, IPY56192 – SR140 IPv6. If using IPv6, the local IPv6 address must be configured in the sip_ContactV6 parameter.
- IPY56207 – SR140 Linux loopback. If using Linux and IPv6, in order to make a loop-back call use the IPv6 address instead of [::1]. If using Linux and IPv4, in order to call the address 127.0.0.1 you must not specify an address in the sip_Contact parameter.

Call Control

- IPY53972 – If caller ID is enabled on FXS loop start lines, the "number of rings" parameter must be set to 2 or greater in order to detect the caller ID.
- IPY54298 – On single-span digital TR1034 models, using R2 signaling, an MFR2 call might be dropped when all channels receive or originate calls simultaneously. The dropped calls will return with "Misc error: Channel not in connected state" errors.
- IPY54142 - When using H.323, fast-start and no tunneling. With certain remote devices the connect message will not be sent when the remote end has disabled tunneling and is configured for fast-start. The symptom is inbound calls not sending the connect message to the remote end. The workaround is to enable tunneling on the remote end.
- IPY57181- Cisco Cube will fail to re-invite the SR140 to T.38 when the SR140 is configured to support multiple audio codecs for G.711 when using SIP (Cisco bug id CSCsi10343). The workaround is to select only one of the audio codecs.

Fax

- IPY80657, IPY54862 – When receiving a V.34 fax using MMR compression over the wire, 1200x1200 resolution, and either A3 or B4 page width, an error can occur if the received fax data is stored on the host in MH compression. To prevent an error from this rare case, the data should be stored onto the host using either MR or MMR compression. Use the API function BfvFaxSetReceiveFmt to set the compression.

- IPY56054, IPY56116 – Cisco 2821 using V34 T38. When using V34 T38 on a Cisco 2821, received faxes may fail returning various hangup codes. The greater the number of simultaneous channels using T38 V34 on the 2821, and the more complex the image, the higher the failure rate. Cisco TAC 617057035.

- IPY56586 - Cisco 2901 using V34 T38. Sent or received faxes may fail returning various hangup codes. This is due to a variety of issues including; all calls to non-V34 fax devices failing, in V17 mode all faxes would be limited to 9600bps and ECM mode disabled. Cisco TAC 6107057091, 617057073 and 615450733. Cisco reports these TACs are resolved with IOS 15.2.2T, this has not yet been verified by Dialogic.

- IPY56389 - SR140 V34 G.711 fax pass-through on Virtual Machines (VMs) not supported. VMs work by time-sharing host physical hardware, and they cannot exactly duplicate the timing behavior of a physical machine. Timing inaccuracies vary depending upon many factors including the hardware, VM, VM configuration, Client Operating System, and the utilization of the hardware by applications on the same or other VM clients. V34 G711 fax pass-through is very sensitive to these VM timing inaccuracies, causing various fax failures which increase with high loads. We are actively researching solutions to better address this.

- IPY56980 –SR140 V.17 G.711 fax pass through when using Windows on VMware has excessive PPRs. Due to the timing inaccuracies, an excessive number of PPRs were experienced, although fax completion rates were acceptable.

- IPY57260 - Due to improper free memory space calculations done by the driver, under certain uncommon timing conditions depending on the pattern of data being transferred and the speed of the system, data may be dropped. This has been seen as a HNG_INTERRUPT_OVERRUN error under T.38 Internet Aware Fax.

Miscellaneous

- IPY54004 – Calls may terminate on DID lines if sample application debug information is sent to the screen. Debug output sent to the screen delays the time the application answers the incoming call after DID digits are detected. Some DID lines will hang up if this delay exceeds 200ms. Pipe the debug output to a file to avoid this situation.

Deprecated functionality

This section lists functionality which is supported in this release, but is not recommended for new designs because it will not be supported in a future release. For a list of currently unsupported functionality, please refer to the Brooktrout Bfv APIs Reference Manual.

Appendix A - Fax Pass-through (G711 RTP) Network Design Considerations

In spite of being similar in nature, voice and fax pass-through calls are affected differently by IP network impairments. Because fax pass-through calls' data cannot be altered during its transport, these calls are more susceptible to IP problems than voice calls. Voice calls may experience some degradation from certain network impairments, and the parties involved on the call might not even realize the degradation is occurring. In addition, there are mechanisms in place for most compressed audio codecs such as predictive algorithms and packet loss concealment techniques that can assist in masking many network problems. These techniques, however, do not protect fax pass-through transmissions.

Pass-through and T.38 fax calls may also respond differently to certain IP network impairments. The following table lists specific impairments and descriptions of how each one may impact T.38 and pass-through calls.

Impairment	Definition	Description
Packet Loss	A relative measure of the number of packets that were not received compared to the total number of packets transmitted.	Fax pass-through calls are very sensitive to packet loss, especially when carrying high-speed modem modulations. Lab testing shows that as little as 0.02 percent packet loss can cause pass-through calls to fail. T.38 fax calls may use the protocol's redundancy mechanism to handle substantially more packet loss than pass-through. It has been shown that T.38 calls can succeed with up to 10 percent random packet loss.
Delay	The finite amount of time it takes a packet to reach the receiving endpoint after being transmitted from the sending endpoint.	The recommendation for voice is to keep the one-way latency (mouth-to-ear) to less than 150 ms. In the case of fax pass-through and T.38 calls, delay is not typically as much of an issue as it can be for voice.
Jitter	The delay variation between packets or the difference in the end-to-end delay between packets.	Average one-way jitter of less than 30 ms is the recommendation to ensure voice QoS. With T.38 and fax pass-through, average jitter less than 30 ms is not quite as critical.
Clock Skew	The running sum of the differences between when packets actually arrive at a destination and when they were expected.	Synchronization issues between a voice gateway and an IP endpoint are more critical for fax pass-through than for T.38 and voice. When using the pass-through transport method for long fax calls, there can be issues because of the lack of clock synchronization between the DSPs on the voice gateway and an IP endpoint. The gateway and endpoint use different clocks therefore, a clocking discrepancy, ever so slight in some cases, will always exist between the rates that packets are generated and consumed. This slight clocking discrepancy can cause playout buffer underrun/overrun on the voice gateway, which can result in bad image lines or PPRs in Error Correction Mode (ECM).

It should also be noted that Voice Activity Detection (VAD) and silence suppression should be disabled for fax pass-through calls on gateways that do not already perform this action upon detection of fax signals. This is needed in order to avoid fax signal clipping that can be caused by VAD algorithms that are used to suppress silence in voice calls.